COPPER
CAS # 7440-50-8

This fact sheet answers the most frequently asked health questions (FAQs) about copper. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Copper is an element that is found naturally in the environment. Small amounts of copper are necessary for good health; however, very large amounts can cause dizziness, headaches, diarrhea, and liver and kidney damage. Copper has been found in at least 210 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is copper?

(Pronounced kŏpʹər)

Copper is a reddish metal that occurs naturally in the environment. It also occurs naturally in plants and animals. Copper is an essential element for all living things including people.

Copper is extensively mined in the United States and is used to make wire, sheet metal, pipes, and pennies. It is also used in farming to treat some plant diseases; in water treatment; and to preserve wood, leather, and fabrics.

What happens to copper when it enters the environment?

- Copper is emitted to the air through natural processes such as windblown dust and volcanic eruptions.
- Human activities such as copper smelting and ore processing also result in copper being released to the air.
- Copper may enter the air when it is applied as a fungicide to plants, wood, fabric, and leather.
- Copper is released to water as a result of natural weathering of soil.
- It may also be released to water from discharges from industries and sewage treatment plants.
- Copper may also be added to lakes and ponds to control algae.

How might I be exposed to copper?

- By breathing air and eating food containing copper.
- By drinking water containing copper, particularly if you have copper pipes.
- By swimming in lakes or ponds where copper was added to the water.
- By handling coins and touching other metals containing copper.
- By touching soil near industries where copper is mined or disposed of.

How can copper affect my health?

Copper is necessary for good health. However, very large doses can be harmful. Long-term exposure to copper in the air can irritate your nose, mouth, and eyes, and cause dizziness, headaches, and diarrhea.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

Eating or drinking very high amounts of copper can cause liver and kidney damage and effects on the blood. Drinking water with higher than normal levels of copper can cause vomiting, diarrhea, stomach cramps, and nausea.

Skin contact with copper can result in an allergic reaction in some people. This reaction is usually skin irritation or a skin rash.

Animal studies have shown effects on the stomach and abnormalities in development when animals were fed a diet high in copper.

How likely is copper to cause cancer?

Copper has not been shown to cause cancer in people or animals. The International Agency for Research on Cancer (IARC) has determined that copper is not classifiable as to human carcinogenicity.

Is there a medical test to show whether I've been exposed to copper?

Copper can be measured in the urine and blood. High levels of copper in these fluids can show that you have been exposed to high levels of copper. Samples can be collected in a doctor's office and sent to a laboratory that has special equipment to measure copper levels.

These tests aren't available at most doctors' offices, but can be done at special laboratories that have the right equipment. However, these tests cannot tell you when you were exposed or to how much, or whether health effects will occur.

Has the federal government made recommendations to protect human health?

The EPA has set a treatment technique for copper in drinking water that includes an action level of 1.3 milligrams of copper per liter of water (1.3 mg/L).

The EPA has also set a secondary maximum contaminant level (SMCL) of 1 mg/L of copper in drinking water. An SMCL is a nonenforceable drinking water standard based on taste, odor, or other aesthetic considerations.

The EPA requires that spills or accidental releases into the environment of 5,000 pounds or more of copper be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set occupational exposure limits of 0.1 milligram of copper per cubic meter of air (0.1 mg/m^3) as fumes and 1 mg/m^3 of copper as dust and mists for an 8-hour workday, 40-hour workweek.

The federal recommendations have been updated as of July 1999.

Glossary

Aesthetic: Relating to the senses (smell, taste, etc.).

Carcinogenicity: Ability to cause cancer.

CAS: Chemical Abstracts Service.

Fungicide: A substance that kills fungi, a group of plants that include molds, mildews, mushrooms, and yeast.

Long-term: 365 days or longer.

Milligram (mg): One thousandth of a gram.

Source of Information

Agency for Toxic Substances and Disease Registry. 1990. Toxicological profile for copper. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Animal testing is sometimes necessary to find out how toxic substances might harm people or to treat those who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-639-6359. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.